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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/763,306	01/23/2004	Shih-Wei Chou	TS01-1503	6528
42717	7590	11/01/2005	EXAMINER	
HAYNES AND BOONE, LLP 901 MAIN STREET, SUITE 3100 DALLAS, TX 75202			RODGERS, COLLEEN E	
			ART UNIT	PAPER NUMBER
			2813	

DATE MAILED: 11/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/763,306

Applicant(s)

CHOU ET AL.

Examiner

Colleen E. Rodgers

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 September 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) 25-39 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 4-24 is/are allowed.
- 6) ☒ Claim(s) 1 is/are rejected.
- 7) ☒ Claim(s) 2,3,5,8,10,16-18 and 20 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 January 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>03/19/2004</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 25-39 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 9 September 2005.

Drawings

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: 34 (Fig. 3). Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

3. The disclosure is objected to because of the following informalities: on page 4, line 7, remove the extra space: "electroplating ." for correct grammar; on page 6, line 3, and page 7, line 16, replace "carbammate" with --carbamate-- for correct spelling; on page 7, line 13-14, replace "3-

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sulfopropyl disulfide” with --3-sulfopropyldisulfide-- for consistency; on page 7, line 16 replace “n,n-dimethyl-dithiocabamic acid-(3-sulfopropyl)ester” with --n,n-dimethyl-dithiocarbamic acid-(3-sulfopropyl)ester-- for correct spelling.

Appropriate correction is required.

Claim Objections

4. Claim 5 is objected to because of the following informalities: in line 2, replace “g/LH₂SO₄” with --g/L H₂SO₄-- for correct grammar. Appropriate correction is required.
5. Claim 8 is objected to because of the following informalities: in line 2, replace “3sulfopropyl disulfide” with --3-sulfopropyldisulfide-- for consistency. Appropriate correction is required.
6. Claim 10 is objected to because of the following informalities: in line 2, replace “3-mercapto-1propanesulfonate” with --3-mercapto-1-propanesulfonate-- for proper naming; also in line 2, replace “dibenzyl-dithio-carbammat” with --dibenzyl-dithio-carbamate-- for proper naming; in line 3, replace “n,n-dimethyl-dithiocabamic acid-(3-sulfopropyl)ester” with --n,n-dimethyl-dithiocarbamic acid-(3-sulfopropyl)ester-- for correct naming. Appropriate correction is required.
7. Claim 16 is objected to because of the following informalities: at the end of line 2, replace “microns]” with --microns-- for proper spelling. Appropriate correction is required.
8. Claim 17 is objected to because of the following informalities: in lines 1-2, replace “(3-sulfopropyl) disulfide” with --3-sulfopropyldisulfide-- for consistency; in line 2, replace “3-mercapto-propylsulfonic” with --3-mercapto-1-propanesulfonate-- for consistency and proper naming. Appropriate correction is required.

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9. Claim 18 is objected to because of the following informalities: in line 2, replace "3sulfopropyl disulfide" with --3-sulfopropyldisulfide-- for consistency. Appropriate correction is required.
10. Claim 20 is objected to because of the following informalities: in line 2, replace "3-mercapto-1propanesulfonate" with --3-mercapto-1-propanesulfonate-- for proper naming; also in line 2, replace "dibenzyl-dithio-carbammate" with --dibenzyl-dithio-carbamate-- for proper naming; in line 3, replace "n,n-dimethyl-dithiocarbamic acid-(3-sulfopropyl)ester" with --n,n-dimethyl-dithiocarbamic acid-(3-sulfopropyl)ester-- for correct naming. Appropriate correction is required.

Claim Rejections - 35 USC § 112

11. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

12. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, the compositions of both the first and second electrolytic solutions are said to have been "optimized" for filling trenches of specific widths. The term "optimized" is a relative term which renders the claim indefinite. The term "optimized" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Claim Rejections - 35 USC § 102

13. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

14. Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by **Basol et al** (US Patent Application Publication 2004/0012090 A1).

Regarding claim 1, **Basol et al** discloses a method to form damascene structures, comprising: providing a substrate having an upper surface in which are a plurality of trenches that have at least two different widths, said trenches having a conductive surface [see Fig. 1; paragraph 0006]; providing a first electrolytic solution, whose composition has been optimized for filling trenches whose width is less than about 0.2 microns (in this instance, 0.1 μm) [see paragraphs 0012-0014], and a second electrolytic solution, whose composition has been optimized for filling trenches whose width is greater than about 1 micron (in this instance, greater than 2 μm) [see paragraphs 0012-0015]; electroplating from said first solution a sufficient thickness of a metal to overfill all trenches whose width is less than about 0.2 microns while underfilling all trenches whose width is greater than about 1 microns [see paragraph 0014]; and then electroplating from said second solution a sufficient thickness of said metal to overfill all trenches [see paragraph 0015].

Allowable Subject Matter

15. Claims 2 and 3 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

16. Claims 4-24 are allowed.

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17. The following is a statement of reasons for the indication of allowable subject matter: the closest prior art failed to teach or make obvious all of the elements of the instant invention in combination.

The prior art of **Basol et al** (US Patent Application Publication 2004/0012090 A1) teaches a substrate having a conductive surface in Fig. 1 in which a plurality of trenches having at least two different widths exist, said trenches having a conductive surface, and providing two electrolytic solutions for plating. Regarding claims 2 and 3, **Basol et al** does not disclose the inclusion of polymers. Regarding independent claims 4 and 14 (and so, by extension, dependent claims 5-13 and 15-24), **Basol et al** does not disclose relative concentrations of accelerator additives (specifically that the concentration of the accelerator additive in the second electrolytic solution is greater than the concentration of the accelerator additive in the first electrolytic solution).

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Colleen E. Rodgers whose telephone number is (571) 272-8603. The examiner can normally be reached on Monday through Friday, 7:30 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead can be reached on (571) 272-1702. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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GEORGE ECKERT
PRIMARY EXAMINER